InfoMediator: Weaving Clinical Expertise in Online Health Communities

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Abstract

Chronic illness patients increasingly turn to online health communities to seek support. Unlike face-to-face support groups (F2F), many online health communities lack resources to provide health professional moderators’ expertise during peer-patient conversations. In this poster, I describe my plans to support both patients and moderators by semi-automatically weaving clinical expertise in online health communities. I will (1) develop methods and techniques to transfer the advantages of F2F to online patient communities and (2) assess patients’ self-management outcomes through their exposure to online communities that use those methods. Specific techniques involve information extraction, user-centered design, and collaborative user feedback to reuse information generated by health professionals for online peer-patient conversation threads.

Introduction: Patients’ Information Needs and Online Health Communities

Much of chronic illness care happens in between visits with health care providers. Patients must take prescribed medications, follow diet and exercise regimens, self-monitor, and emotionally cope with the challenge of living with diabetes. Many patients find carrying out these multiple tasks challenging. Although clinic based diabetes care programs are critical ways to support patients’ diabetes management, they often cannot meet all patients’ needs. Outreach visit times are too short for patients’ questions to be fully answered, and although intensive care management interventions with health care providers in between hospital visits are shown to be increasingly effective, these interventions are resource and labor intensive. Many health care systems lack the resources to implement such intensive nurse-led intervention programs. At the same time, numerous research studies show social support is associated with better diabetes and other illness self-management. A randomized controlled trial study shows that peer support has increased benefit in medical outcomes (HbA1C) compared to nurse care management.

Conclusively, previous research shows both health professional-led intervention programs and peer support give strong promise for improving patients’ self-management practices. My thesis work and recent publications show the critical role that health professionals play in face-to-face diabetes patient support groups that is lacking in online patient communities. Online patient communities are potentially cost-effective ways to provide social support, but because it is on the Internet, many concerns arise around the quality of social and informational support. In my proposed research, I will bring in the advantages of health professional-led intervention programs and social support of peers to increase the quality of online patient communities. To address this challenge, I will develop methods and techniques that require minimal resource and labor for supporting patients’ self-management of the disease. My research will further advance our understanding of scalable delivery of information generated by health professionals and how combination of reused information from health professionals with social support can lead to changes in health outcomes. Below, I describe the aims to achieve the goal.

Aim 1. Develop framework and methods in Natural Language Processing (NLP) for classifying online patient conversation threads.

First, we will interview health professionals and patients to hear their opinions for where in peer-patient threads they want to see further clinical expertise. With the interview findings, we will develop annotation guidelines and perform annotation tasks with annotators. The resulting annotated data will be used as a training set, with which we will develop feature sets useful for automatic identification of places in peer-patient conversations that need clinical expertise.

Aim 2. Develop user interface techniques including user feedback mechanisms.

We will develop user interface techniques of the InfoMediator system through iterative paper-prototyping, Wizard-of-Oz, and interviews with users. Using low-fidelity prototypes, we will identify user needs in giving user feedback on the system’s output (which part of peer-patient conversations need clinical expertise and the retrieved clinical expertise) as well as users manually specifying where they want the system to add clinical expertise to.

First, we will evaluate the quality of clinical expertise search results from site-specific searches of health professionals’ contributions in online community settings. Second, we will implement an interactive InfoMediator prototype and evaluate outcomes of diabetes self-management abilities through a 6-month study.

**Outcomes and impact.** Outcomes will be three-fold. The first outcome will be combining NLP methods and techniques and user feedback to semi-automatically identify places in peer-patient conversation context that need health professionals’ expertise. Second will be understanding socio-technical issues around semi-automatically inserting clinical expertise into peer-patient conversations. Third will be patients’ outcomes of diabetes self-management abilities from using the InfoMediator prototype. This research will impact my long-term goal of augmenting online patient communities to become a place for delivering high quality health information to patients.

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**References**